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(54) [Title of the Invention] POWDER COSMETIC

(57) [Abstract]

[Constitution] Powder cosmetic containing the following components (a)  
to (d) and liquefying when applied to the skin with a patting motion:

- |  |       |     |
|--|-------|-----|
| (a) Hydrophobized silicic anhydride with a surface area of at least 80 m <sup>2</sup> /g | 0.1-7 | wt% |
| (b) Fluorine compound-coated cosmetic powder   | 1-50  | wt% |
| (c) Oily component   | 30-40 | wt% |
| (d) Aqueous component  | 30-90 | wt% |

[Effect] Although the cosmetic is a powder, it liquefies when applied with a patting motion, creating a cooling, moist sensation, showing excellent affinity for the skin,

softening, moisturizing, and providing a good feel and finish.

[Claims]

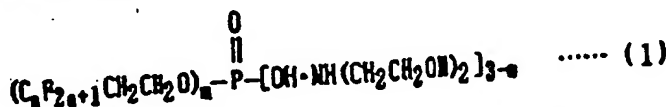
[Claim 1] Powder cosmetic characterized by the fact that

it contains the following components (a) to (d) and liquefies when applied to the skin with a patting motion:

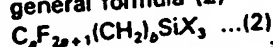
- |     |  |           |
|-----|--|-----------|
| (a) | Hydrophobized silicic anhydride with a surface area of at least 80 m <sup>2</sup> /g | 0.1-7 wt% |
| (b) | Fluorine compound-coated cosmetic powder   | 1-50 wt%  |
| (c) | Oily component   | 30-40 wt% |
| (d) | Aqueous component  | 30-90 wt% |

[Claim 2] Powder cosmetic in Claim 1, wherein the fluorine compound is at least one selected from among

perfluoroalkyl phosphate diethanolamine salts described by general formula (1):



(where  $n$  denotes an integer ranging from 6 to 18, and  $m$  denotes 1 or 2) and perfluoroalkylsilane described by general formula (2)



(where  $a$  denotes an integer ranging from 1 to 12,  $b$  denotes an integer ranging from 1 to 5, and  $X$ s may be the same or different, denoting an alkoxy group [poorly legible], halogen atom, or alkyl group, except where all of the  $X$ s are alkyl groups).

[Claim 3] Powder cosmetic in Claim 1, which is obtained by mixing and powdering component (b) and component (c), admixing component (a), and then admixing and powdering component (d).

[Detailed Description of the Invention]

[0001]

[Industrial Field of Application] The present invention relates to cosmetic powder which, although it is a cosmetic in a powder modality, liquefies when applied with a patting motion, assuming liquid-like characteristics and providing a good feel and finish.

[0002][Prior Art and Problems To Be Solved by the Invention] Cosmetics in a powder modality such as face powder are known in the prior art, but in use such

powders tend to "fly," provide a powdery finish, and dry the skin. Powder cosmetics have been mixed with water, oils, liquid cosmetics, and the like in order to promote the permeation of medicaments into the skin and to provide a moisturizing, lubricating, and softening effect, but such products are awkward to use and have other drawbacks. [0003] Accordingly, the industry desires a cosmetic that is in powdered form but has the properties of a liquid, is easy to use, and has other desirable characteristics.

[0004]

[Means of Solving the Problems] The present inventors conducted extensive research aimed at overcoming these problems. As a result, they discovered a powder cosmetic which is in a powder modality, but is cooling and moist, shows affinity for the skin, softens, and lubricates. They obtained this powder by powdering an aqueous component and an oily component with specific hydrophobized silica anhydrides and fluorine compound-coated cosmetic powders, leading to the invention.

[0005] Thus, the present invention is a powder cosmetic characterized by the fact that it contains the following components (a) to (d) and liquefies when applied to the skin with a patting motion:

- |     |  |           |
|-----|--|-----------|
| (a) | Hydrophobized silicic anhydride with a surface area of at least 80 m <sup>2</sup> /g | 0.1-7 wt% |
| (b) | Fluorine compound-coated cosmetic powder   | 1-50 wt%  |
| (c) | Oily component   | 30-40 wt% |
| (d) | Aqueous component  | 30-90 wt% |

[0006] In compound (a), hydrophobized silicic anhydride, used in the invention, the surfaces of fine silicic anhydride particles are coated with organosiloxane compounds, silicone compounds, fluorine compounds, or the like. Examples of compound (a) include trimethylsiloxylated silicic anhydride (Cabot Co., Cabosil TS-530, surface area 325 mg<sup>2</sup>/g), dimethylsiloxylated silicic anhydride (Degussa Co., Aerosil R-972, surface area 110 ± 20 m<sup>2</sup>/g), octylsiloxylated silicic anhydride (Degussa Co., Aerosil R-805, surface area, 150 ± 25 m<sup>2</sup>/g), and silicone oil-treated silicic anhydride (Degussa Co., Aerosil R-202, surface area 100 ± 20 m<sup>2</sup>/g), and silicic anhydride that has been coated with fluorine compound (1) or (2) hereinbelow. The surface area of these silicic anhydrides must be at least 80 m<sup>2</sup>/g. If it is less, the particle size of

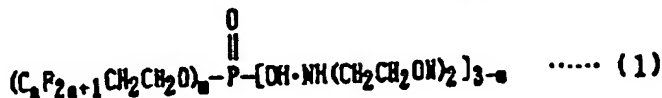
the hydrophobized silicic anhydrides will be too large, they will not orient on the surface of the aqueous component in large amounts, and the aqueous component cannot be stably powdered.

[0007] There are no particular restrictions on component (b) of the invention, fluorine compound-coated cosmetic powder, provided that it is a substance generally used in cosmetics. Examples include talc, mica, kaolin, magnesium carbonate, calcium carbonate, aluminum silicate, magnesium silicate, calcium silicate, titanium oxide, zinc oxide, red iron oxide, yellow iron oxide, black iron oxide, Prussian blue, ultramarine blue, tar pigments, natural pigments, micaceous titanium, micaceous titanium iron oxide, bismuth oxychloride, nylon powder, and silk powder.

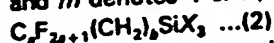
[0008] The preferred fluorine compounds for imparting hydrophobicity and lipophobicity to these cosmetic powders are perfluoroalkyl phosphate diethanolamine salts described in general formula (1) and perfluoroalkylsilanes, examples including Asahi Guard AG530 (made by Asahi Glass K.K.), LS-160, LS-360, LS-912, LS-1080, LS-1090,

LS-1465 (made by Shinetsu Kagaku Kogyo K.K.), and XC95-418, XC95-466, XC95-467, XC95-468, XC95-469, XC95-470, XC95-471, XC95-472 (made by Toshiba Silicone K.K.).

[0009] The component (b) powder must be coated with these fluorine compounds  
[Formula 2]



[0010] (where  $n$  denotes an integer ranging from 6 to 18, and  $m$  denotes 1 or 2)



(where  $a$  denotes an integer ranging from 1 to 12,  $b$  denotes an integer ranging from 1 to 5, and  $X$ s are identical or different, denoting an alkoxy group, halogen atom, or alkyl group, except where all  $X$ s are alkyl groups).

[0011] There are treatments for rendering powders hydrophobic besides using fluorine compounds, examples including treatments with oily substances such as silicone and high-melting-point waxes, and various surface treatments using metallic soaps and the like. However, such treatments do not render powders lipophobic, and when the treated powders are mixed with the oily component, they are wetted, and they wet the hydrophobized silicic anhydride, impairing their ability to powder the aqueous component. Powdering the aqueous component with inadequately treated powder requires massive amounts of hydrophobized silicic anhydride. Although it is possible to do this, it is undesirable from a functional standpoint because the composition does not liquefy smoothly when used. However, powders treated with these prior art methods and untreated powders can be used in mixtures with fluorine compound-treated cosmetic powders in amounts that do not compromise the effect of the invention.

[0012] As an example of how to use perfluoroalkyl phosphate diethanolamine salts in general formula (1) as the fluorine compound for treating the cosmetic powder, water is added to the cosmetic powder to make a slurry, and in a separate operation water is added to perfluoroalkyl phosphate diethanolamine salt (1) while stirring to obtain a 0.1-5 percent by weight emulsion. The emulsion is poured and mixed slowly into the slurry, then the emulsion is broken by allowing it to stand at ordinary or high temperatures or the like, and the resultant material is washed, filtered, and dried. A method such as that used for treating the hydrophobized powder with silicone, metallic soap, or the like can be used to treat the powder with a perfluoroalkylsilane described by general formula (2). For example, perfluorosilane (2) by itself or diluted with a solvent (for example, methanol, ethanol, chloroform, dichloromethane, volatile silicone, or water) should be sprayed onto or added dropwise to the cosmetic powder while stirring, dispersed uniformly, and dried at room temperature or by heating.

[0013] Any solid, semisolid, or liquid vegetable oil, animal

oil, mineral oil, or synthetic oil, conventionally used in cosmetics, can be used as component (c) of the invention, the oily component. Concrete examples include oily fats such as olive oil, jojoba oil, mink oil, and Japan wax; waxes such as beeswax and candelilla wax; hydrocarbons such as liquid paraffin, microcrystalline wax, and petroleum jelly; fatty acids such as stearic acid and oleic acid; higher alcohols such as cetyl alcohol; esters such as isopropyl myristate; lanolin derivatives such as isopropyl lanolin fatty acid ester and lanolin alcohol; and silicone compounds such as methyl polysiloxane and methyl phenyl polysiloxane. These oily components can be used singly or in combinations of two or more, and they can be used in combination with so-called oily gelling agents such as organically modified clay, starch fatty acid esters, and dimethyl polysiloxane polymers having a three-dimensional cross-linked structure. Additional substances that can be used as oily components include finely powdered high-melting-point waxes such as microcrystalline wax; porous powders such as magnesium carbonate; oily components that have been adhered to highly coagulable polymers such as acrylate copolymers and then powdered; and encapsulated oily components such as poly(methyl methacrylate).

[0014] There are no particular restrictions on component (d) of the invention, the aqueous component, provided that it is a substance conventionally used in cosmetics, examples including purified water; glycol; polyhydric alcohols such as glycerol; and water-soluble polymers.

[0015] Components (a)-(d) of the invention are blended in the following proportions with respect to the entire composition.

Component (a) is blended in amounts of 0.1-7 percent by weight (hereinafter, simply referred to as percent), preferably 2-4 percent. If less than 0.1 percent is used, the aqueous component cannot be powdered sufficiently, and the desired powder modality cannot be obtained. If more than 7 percent is used, large amounts of the aqueous component can be powdered, but the cosmetic does not liquefy when applied, even if applied with a patting motion, and it does not have a liquid feel. Component (b) is blended in amounts of 1-50 percent. If less than 1 percent is used, component (c) cannot be blended into the composition, and if more than 50 percent is used, a liquid feel is not obtained when the cosmetic is used.

Component (c) is blended in amounts of 30-40 percent. If more than 40 percent is used, the hydrophobized

silicic anhydride is wetted, the hydrophobized silicic anhydride and the oily component form a continuous phase, and the cosmetic cannot be powdered and will not liquefy smoothly.

The aqueous component, component (d), is blended in amounts of 30-90 percent, although this varies according to the proportions in which components (a) and (b) are blended. If less than 30 percent is used, the cosmetic will not liquefy when applied with a patting motion, and if more than 90 percent is used, the composition cannot be powdered, which is undesirable from the standpoint of function.

[0016] Examples of components that can be used in the powder cosmetic of the invention, in addition to the essential components listed hereinabove, include fragrances, preservatives, ultraviolet absorbers, antioxidants, and beauty components in amounts that do not compromise the effect of the invention.

[0017] The powder cosmetic of the invention is

manufactured by, for example, mixing and powdering components (b) and (c), admixing component (a), and then admixing and powdering component (d).

[0018] In the powder cosmetic of the invention, component (d) is adsorbed on component (a) and component (c) is adsorbed on component (b). When the cosmetic is applied with a vigorous patting motion, this state of adsorption is broken down, and powdered components (c) and (d) coalesce and liquefy.

[0019]

[Working Examples] The present invention is further described hereinbelow by means of working examples, but the invention is not limited by these examples.

[0020] Working Examples 1-2, Comparative Example 1 Face powder with the compositions shown in Table 1 were manufactured.

[0021]

[Table 1]

Component (%)	Working Example		Comparative Example 1
	1	2	
1. Titanium treated with Asahi Guard AG530 (5%) <sup>*1</sup>	0.5	0.5	0.5
2. Talc treated with Asahi Guard AG530 (5%) <sup>*1</sup>	12.0	12.0	12.0
3. Mica treated with Asahi Guard AG530 (5%) <sup>*1</sup>	3.5	3.5	3.5
4. Pigment treated with Asahi Guard AG530 (5%) <sup>*1</sup>	1.0	1.0	1.0
5. Trimethylsiloxyated silicic anhydride (surface area: 325 m <sup>2</sup> /g)	3.0	3.0	3.0
6. Liquid paraffin	3.0	3.0	3.0
7. Microcrystalline wax <sup>*2</sup>	15.0	15.0	40.0
8. Dimethyl polysiloxane (20 cs) supported on acrylate copolymer <sup>*3</sup>	20.0	—	7.0
9. Poly(methyl methacrylate) enclosed in squalane <sup>*4</sup>	—	25.0	—
10. Purified water	42.0	37.0	30.0

\*1: Manufactured as described hereinabove with Asahi Guard AG530.

\*2: Finely powdered microcrystalline wax.

\*3: Acrylate copolymer (Polytrap Q5-6603 Dow Corning Co.):dimethyl polysiloxane (20 cs) = 1:3 parts

\*4: Poly(methyl methacrylate) (Matsumoto Microspheres, made by Matsumoto Yushi Seiyakusha) enclosed in 60% squalane

[0022] (Manufacturing Method)

A: Nos. 1-4 were mixed and reduced to powder.

B: No. 6 was melted by heating, mixed with "A," and then Nos. 7-9 were added and mixed in. Mixing was accomplished by stirring.

C: "B" and No. 5 were stirred together.

D: No. 10 was mixed into "C," and the resultant composition was packed in containers to obtain face powder.

[0023] Working Example 3.

Face powder with the following composition was manufactured.

[Table 2]

Component	(%)
1. Talc treated with Asahi Guard AG530 (5%) <sup>*1</sup>	18.5
2. Pigment treated with Asahi Guard AG530 (5%) <sup>*1</sup>	0.5
3. Silicic anhydride treated with LS160 (5%) (Surface area: 110 ± 20 m <sup>2</sup> /g) <sup>*2</sup>	3.0
4. Trimethylsiloxyated silicic anhydride (Surface area: 325 m <sup>2</sup> /g)	3.0
5. Microcrystalline wax <sup>*3</sup>	20.0
6. Liquid paraffin	10.0
7. Starch fatty acid ester	5.0
8. Glycerol	2.0
9. Purified water	38.0

\*1: Manufactured in the above-described manner with Asahi Guard AG530.

\*2: Manufactured in the above-described manner with LS160.

\*3: Powdered microcrystalline wax.

[0024] (Manufacturing Method)

A: Nos. 1 and 2 were mixed and reduced to powder.

B: Nos. 6 and 7 were melted by heating, mixed with "A," and No. 5 was added and mixed in. Mixing was accomplished by stirring.

C: Nos. 3 and 4 were stirred into "B."

D: Nos. 8 and 9 were stirred into "C," and the resultant composition was packaged in containers to obtain face powder.

[0025] While the powder cosmetics of Working Examples 1-3 obtained in the above-described manners are

powders, they liquefy smoothly when applied with a patting motion, imparting a cooling, moist sensation, showing great affinity for the skin, acting as an emollient, and imparting moisture. By contrast, the material obtained in Comparative Example 1 could be powdered, but it could not be liquefied with a patting motion and did not have the effect of the invention in any sense.

[0026]

[Effect of the Invention] The powder cosmetic of the present invention has a good feel and provides a good finish. Although it is a powder, it liquefies smoothly when applied with a patting motion, imparting a cooling, moist sensation, showing great affinity for the skin, acting as an emollient, imparting moisture, and the like.

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